

LOWER HAULING COSTS ON IMPROVED ROADS

Improved Roads Effect Saving of \$627,406 in Eight Counties.

Improvement of roads in eight selected counties in different sections of the United States resulted, in the aggregate, in a total gross annual saving in hauling costs of \$627,406, according to recent economic studies made by the office of public roads and rural engineering of the department. The cost of haulage for the group of counties is lower since the roads were improved. It was found, even when charges are made in the comparative computations for interest on bonds and annual maintenance costs. The result of the studies, which extended from 1909 to 1915, and which included other effects of improved highways than those on traffic, are shown in department bulletin 393, recently published.

The eight counties in which the studies were made are Spotsylvania, Dinwiddie, Lee and Wise counties, Virginia; Franklin county, New York; Dallas county, Alabama; Lauderdale county, Mississippi; and Manatee county, Florida. These counties were selected because they had just issued bonds for road improvement when it was decided to make the studies, and it would therefore be possible to cover the road improvements from outset to completion.

The average gross annual saving in hauling costs due to the road improvements in these eight counties was found to be 17.9 cents per ton mile, while the net saving was found to be 11.6 cents. The investigators point out in the bulletin that an actual cash saving to the amount indicated is not effected, but that this is the indicated saving when the time of workers and use of draft animals and equipment are given cash values at the rates prevailing in the several communities.

Effects by Counties

In Spotsylvania county, Virginia, a bond issue of \$173,000 was provided and 76 miles of road were improved. The average loads hauled in a two-horse wagon increased materially after the roads were improved, and ton-mile costs dropped from 39 cents to 13.7 cents. This meant a gross ton-mile saving of 16.3 cents, or a net ton-mile saving, when charges were made for interest on bonds and maintenance of roads, of 14.9 cents. The gross total annual saving in the county is, therefore, approximately \$150,000; and when deductions are made for interest and maintenance costs, the annual indicated net saving is \$130,676.

In Dinwiddie county, Virginia, a bond issue of \$105,000 was provided, and the state contributed, in addition, nearly \$40,000 worth of convict labor. The improved road mileage at the completion of the study was 101 miles. Average loads for a two-horse wagon increased from about 2,000 pounds to about 3,200 pounds, and ton-mile costs decreased from 39 cents to 15 cents. The net ton-mile saving is 13.7 cents, and the indicated gross saving for the county is \$124,970.

In Lee county, Virginia, a fund of \$264,000 was provided by bonds, and the state contributed labor worth more than \$21,000. Ninety-nine miles of road were improved. Average loads increased from 1,500 to 4,000 pounds, and ton-mile costs were reduced from 46 to 20 cents, with a net ton-mile saving of 10.6 cents. The gross annual saving for the county was \$59,406.

In Franklin county, New York, bonds to the amount of \$500,000 were issued, and 135 miles of road were improved. Average loads increased from about 2,400 pounds to 5,567 pounds. Ton-mile costs dropped from 39.9 to 9.6 cents, and the net ton-mile saving was 11.7 cents. The gross annual saving in the county for hauling charges has been approximately \$50,000 since the roads were improved.

In Dallas county, Alabama, \$366,977 secured from the bond issue was used to improve 161 miles of road. Average loads increased from 1,500 pounds to 2,500 pounds, and ton-mile hauling costs fell from 39 to 15 cents. The net ton-mile saving was 10.9 cents. It is estimated that the county saves annually \$90,000 gross in hauling costs as a result of the road improvement.

In Lauderdale county, Mississippi, \$500,000 worth of bonds was issued, and 96 miles of road improved. Average loads increased from 1,500 to 2,500 pounds, and hauling costs dropped from 37 to 20 cents per ton-mile. This brought about a net saving of 3.9 cents per ton-mile when all annual charges against the road improvements were considered. The annual gross saving to the county is approximately \$43,400.

In Manatee county, Florida, \$252,500 obtained from a bond issue improved 63 miles of road. Average loads increased from 1,500 pounds to 4,800 pounds, which resulted in a reduction of ton-mile hauling costs

from 45 to 20 cents. The net saving per ton-mile since the roads have been improved is 12½ cents. It is estimated that the county saves annually in gross hauling costs \$32,573.

In Wise county, Virginia, \$1,031,578.54 was provided for road work by bond issues, state contributions, and in other ways. From this fund 63 miles of road have been surfaced and 66 miles graded. Average loads have increased from 1,500 to 2,500 pounds and ton-mile hauling costs have been reduced from 57 to 23 cents. The gross saving to the county, when hauling costs alone are considered, is approximately \$66,000 a year.

THANKSGIVING PROCLAMATION

President Wilson has issued the annual Thanksgiving day proclamation, which reads as follows:

"By the President of the United States of America. A Proclamation:

"It has long been the custom of our people to turn in the fruitful autumn of the year in praise and thanksgiving to Almighty God for his many blessings and mercies to us as a nation. The year that has elapsed since we last observed our day of thanksgiving has been rich in blessings to us as a people, but the whole fact of the world has been darkened by war. In the midst of our peace and happiness our thoughts dwell with painful disquiet upon the struggles and sufferings of the nations at war and the peoples upon whom the war has brought disaster without choice or possibility of escape on their part. We cannot think of our own happiness without thinking also of their pitiful distress.

"Now, therefore, I, Woodrow Wilson, do appoint Thursday, the thirtieth of November, as a day of national thanksgiving and prayer, and urge and advise the people to resort to their several places of worship on that day to render thanks to Almighty God for the blessings of peace and unbroken prosperity which he has bestowed upon our beloved country in such unstinted measure. And I also urge and suggest our duty in this, our day of peace and abundance, to think in deep sympathy of the stricken people of the world upon whom the curse and terror of war has so pitilessly fallen, and to contribute out of our abundant means to the relief of their sufferings. Our people could in no better way show their real attitude toward the present struggle of the nations than by contributing out of their abundance to the relief of suffering which war has brought in its train.

"In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

"Done at the city of Washington, this seventeenth day of November, in the year of our Lord, one thousand nine hundred and sixteen, and of the independence of the United States the one hundred and forty-first.

"WOODROW WILSON."

"By the President,"

"ROBERT LANSING,"

"Secretary of State."

GRAZING RATES TO ADVANCE IN 1917

District Forester George H. Cecil, Portland, Oregon, announces that after careful consideration the secretary of agriculture has approved an increase in the fees to be charged for grazing livestock on the national forest ranges.

This increase will be made gradually for the next three years, until the charges reach a point equivalent to two-thirds of the charges made by private owners for grazing stock on their land.

Stock associations are being advised of this decision in order that statements regarding the views of their members may be submitted to the forester by February 1, 1917, in case they desire to discuss the matter.

Investigation of rental values from time to time, says Mr. Cecil, has revealed that the government charges for grazing on the national forests are only one-third of the market value of the forage. Since timber and other resources of the national forests are sold at their market value, there is an increasing demand that forage resources should be disposed of in like manner.

The national forests were created for the primary purpose of conserving the timber and water supply. The grazing use of the ranges, which was found to exist when active control of the forests was begun, was treated as a secondary matter and only a portion of the administrative cost of handling the forest was asked as a grazing fee.

Since the national forest states share in all the receipts from national forest business to the extent of 25 per cent, the revenue to these states will be materially increased by this decision.

For the fiscal year ending June 30,

1916, the states of Oregon and Washington received \$22,820.65 as their share of the grazing receipts from the national forests within their borders. Without considering increased receipts from other forest resources this figure would be doubled by the advance in grazing rates.

TRACKWAYS ON STATE HIGHWAYS

Looking to the future when California's state highway system will have to bear heavier and more continuous traffic, T. J. Toner, Pacific coast supervisor for the Maxwell Motor Sales Corporation, distributor of the Maxwell car throughout the west, has endorsed the suggestion of Francis M. Hugo, secretary of the state of New York, for the installation of some kind of plate for motor track ways on the state highway.

Toner's opinion is based upon many months of observation of the effect of the increased traffic over the state highway leading out of San Francisco since the system was opened for vehicular transportation.

"Many persons are familiar with the fact that plateways are often used over bridges and certain other places where heavy material is hauled," says Toner, "but the public is not so well aware of the fact that on an 18-foot road—the average width of the main roads—only a small part of this width is actually used by the vehicles which pass over it. Take for instance the state highway south of San Francisco, tire markings of both horse drawn and motor driven vehicles stand out in marked contrast to the balance of the highway, proving conclusively upon the slightest observation that only a small portion of the highway is actually used.

"Yet when the road has to be repaired or renewed the whole width has to be dealt with, as mere patching in most cases cannot be regarded as the most practical method of

maintenance. Consequently one concludes that prepared tracks would save an immense amount of repair and wear. These tracks could be made of special material, continuously smooth in character and sufficiently wide. They would bear nearly all of the traffic and would lengthen the life of the highway ten fold.

"When one considers the rapid increase every year in the number of automobiles alone that use our state highway, one can readily appreciate what this means in wear. The Maxwell car alone furnishes a striking example of the rapid growth in the number of new owners. The factory allotment for the west for the year 1916-17 is nearly 12,000 cars; of this amount 5,900 alone will be sold in California.

THE LAVAS ON ISLAND OF HAWAII

None of the island possessions of the United States exhibit more notable points of interest for the observant traveler or the naturalist than the Hawaiian Islands. The natives are typical of the race inhabiting many island groups of the south Pacific, the plant life has the attractive features of insular development in semitropical latitudes, the marine life of the warm waters is wonderful, but perhaps the most fascinating, instructive and awe-inspiring of all the natural phenomena of Hawaii are furnished by its active volcanoes. The whole group of islands, extending in a chain for many hundred miles, is of volcanic origin though some of the islets and reefs are but the wave-battered remnants of volcanoes whose fires have long since died out.

Approaching Honolulu by steamer from San Francisco, the traveler has the evidence of volcanic action plainly before him in the first land he sees, in the ash cone of Koko Head and the well-preserved craters of Diamond Head and the Punch Bowl which are in the outskirts of the city. The high mountains of the island of Oahu are also made up of black lava—basalt—but they are largely covered with vegetation and one must go to the largest island of the group, Hawaii, for the wonderful demonstration of the process by

which all these island mountains have been built up from great ocean depths. Kilauea, one of the most active, and Mauna Loa, one of the largest volcanoes in the world, are showing just how lava builds up mountains. Both of these volcanoes are included in the newly created Hawaii national park.

Since the time of Captain Cook the Hawaiian Islands have been visited by geologists and others interested in the problems of volcanoes, and much has been written concerning them.

Professional Paper 58, "Lavas of Hawaii and Their Relations," by Whitman Cross, of the United States geological survey, department of the interior, presents a summary of what is now known concerning the lavas of all the islands. This paper is largely technical in its character, for it is intended primarily to serve as a basis for future study of the rocks by geologists.

It appears that there are many other kinds of lavas in Hawaii be-

sides basalt, and many facts of association of the different lavas are of interest to students of the inner history of volcanoes. While much is yet to be learned concerning the lavas of these islands, Mr. Cross shows that present knowledge of the rocks is sufficient to throw light on some of the most vexed questions pertaining to the origin and relations of the igneous rocks of the earth. The chemical relations are discussed with particular thoroughness. Petrologists will find valuable material in this report, bearing on many problems.

Plans have been prepared for a new roundhouse, a 50,000-gallon water tank, a fuel oil tank to hold 25,000 gallons, a pump house and other smaller structures and additional sidetracks in the Southern Pacific yards at Eugene. The expenditure will reach probably \$150,000, and the work will be done under the direction of T. O. Russell, of the engineering department.

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